

FCC Appendix RF Test Data for BLE

FCC ID : 2AF9HS12

Company : Shenzhen CooSpo Tech Co., Ltd

EUT : POWER METER SPIDER

Model Number : S12

Report No. : CTA26082102301

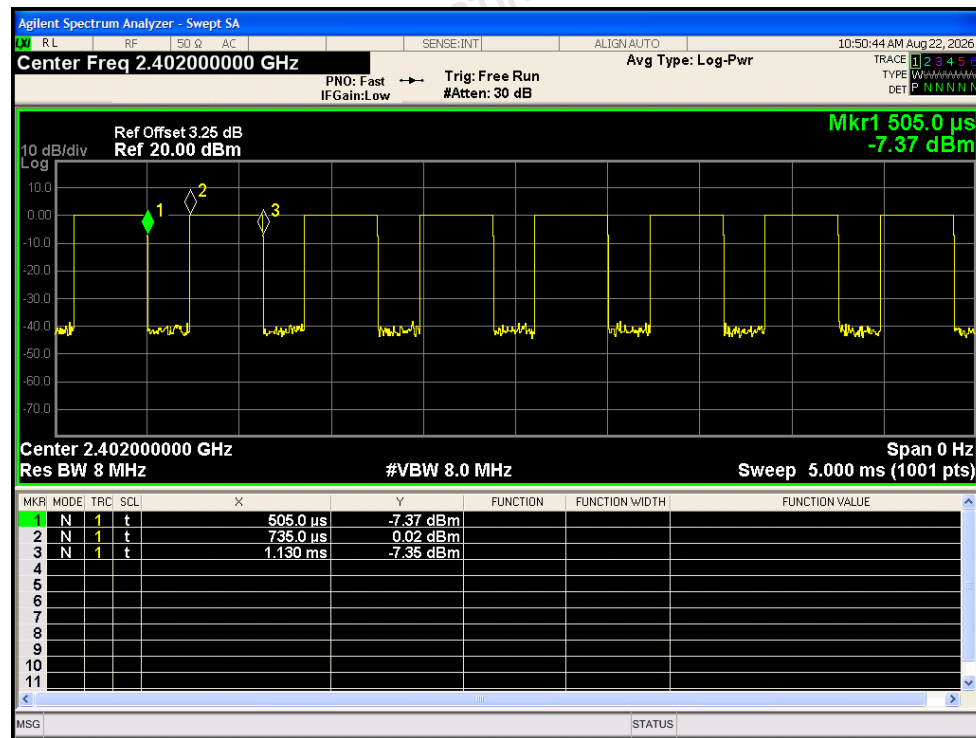
Reviewed By : Eric Wang

Duty Cycle

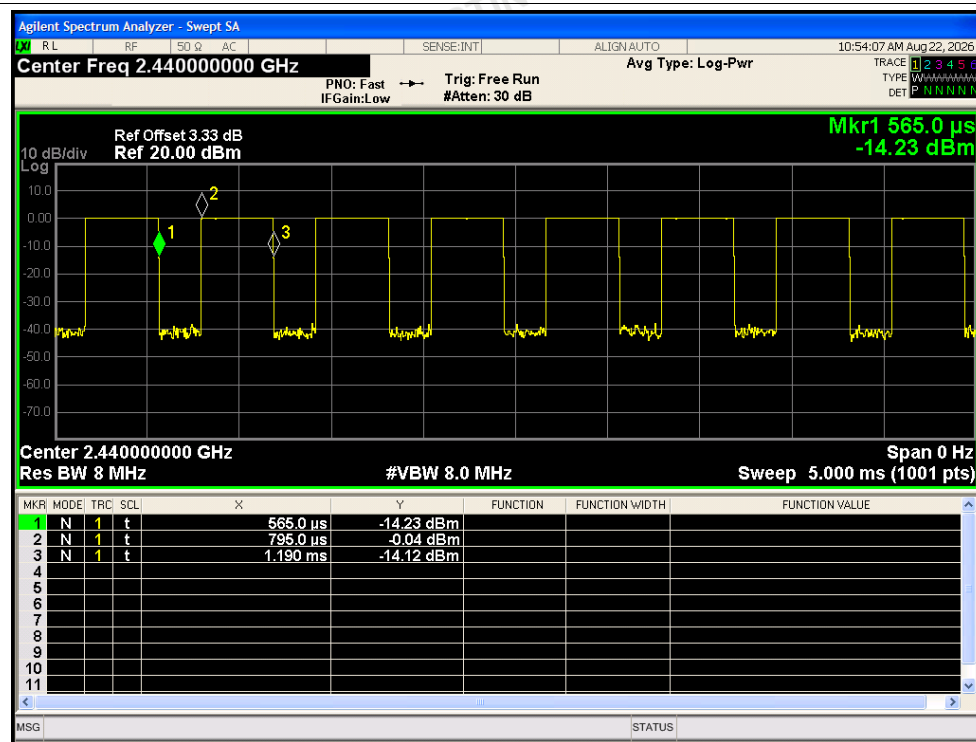
Condition	Mode	Frequency (MHz)	Duty Cycle (%)	Correction Factor (dB)
NVNT	BLE 1M	2402	63.94	1.94
NVNT	BLE 1M	2440	63.94	1.94
NVNT	BLE 1M	2480	63.94	1.94
NVNT	BLE 2M	2402	34.37	4.64
NVNT	BLE 2M	2440	34.37	4.64
NVNT	BLE 2M	2480	34.37	4.64

Test Graphs

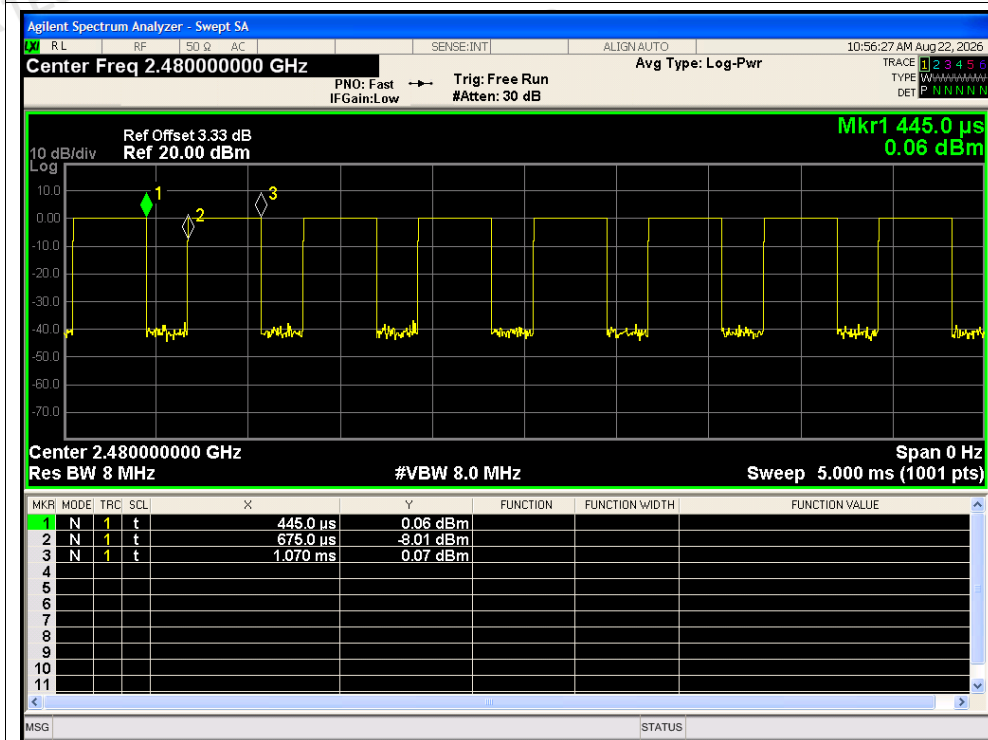
Duty Cycle NVNT BLE 1M 2402MHz



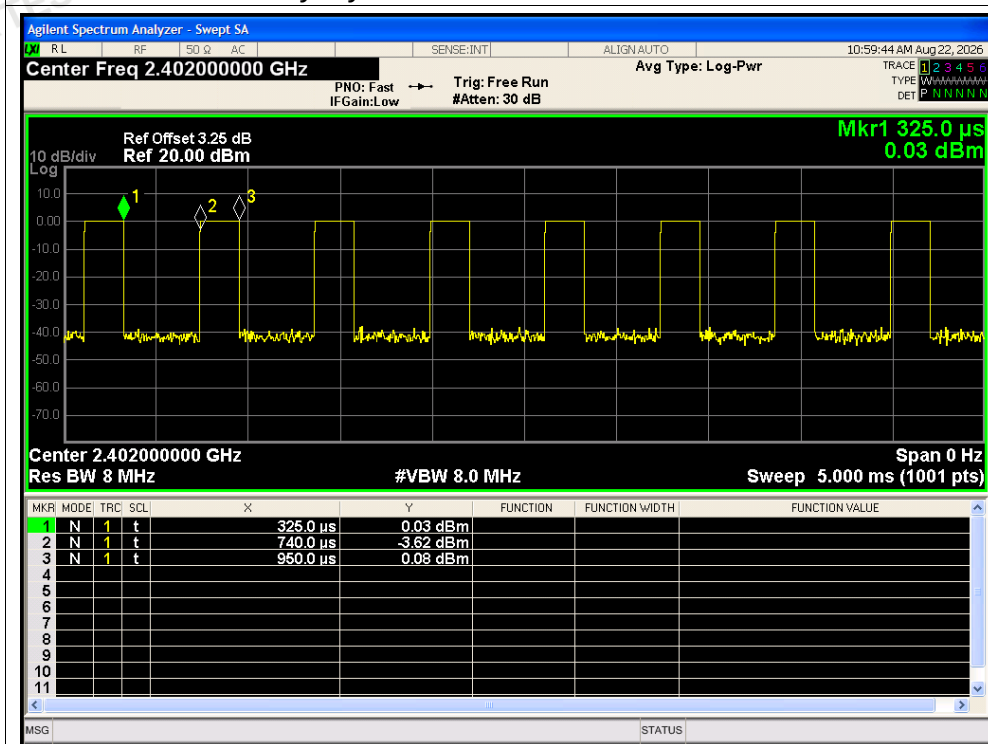
Duty Cycle NVNT BLE 1M 2440MHz



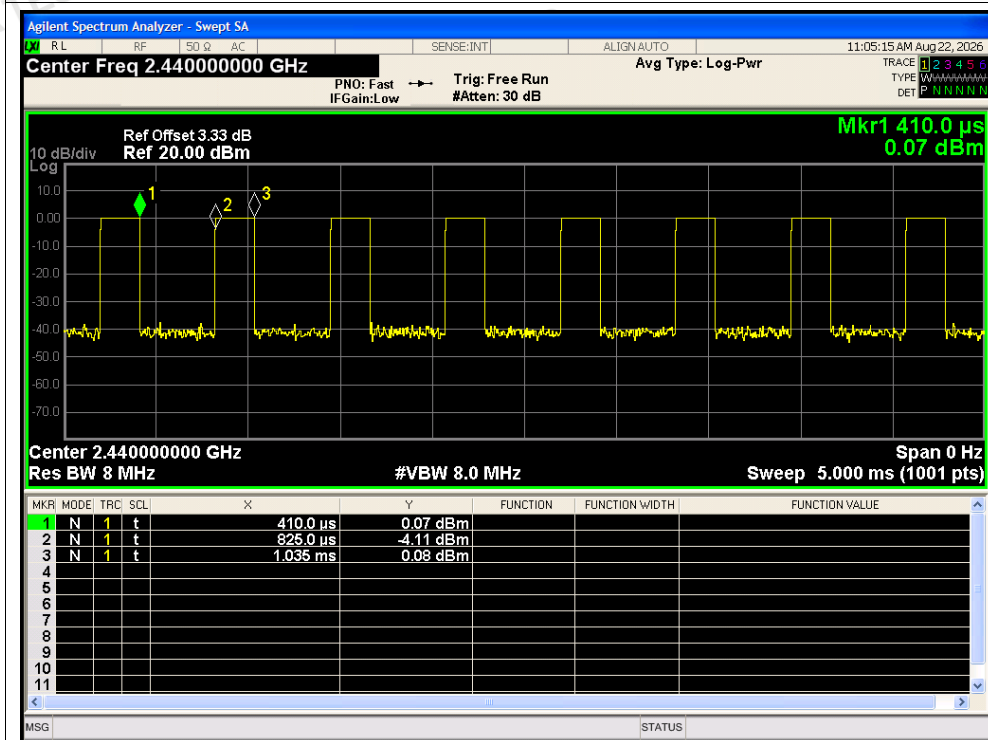
Duty Cycle NVNT BLE 1M 2480MHz



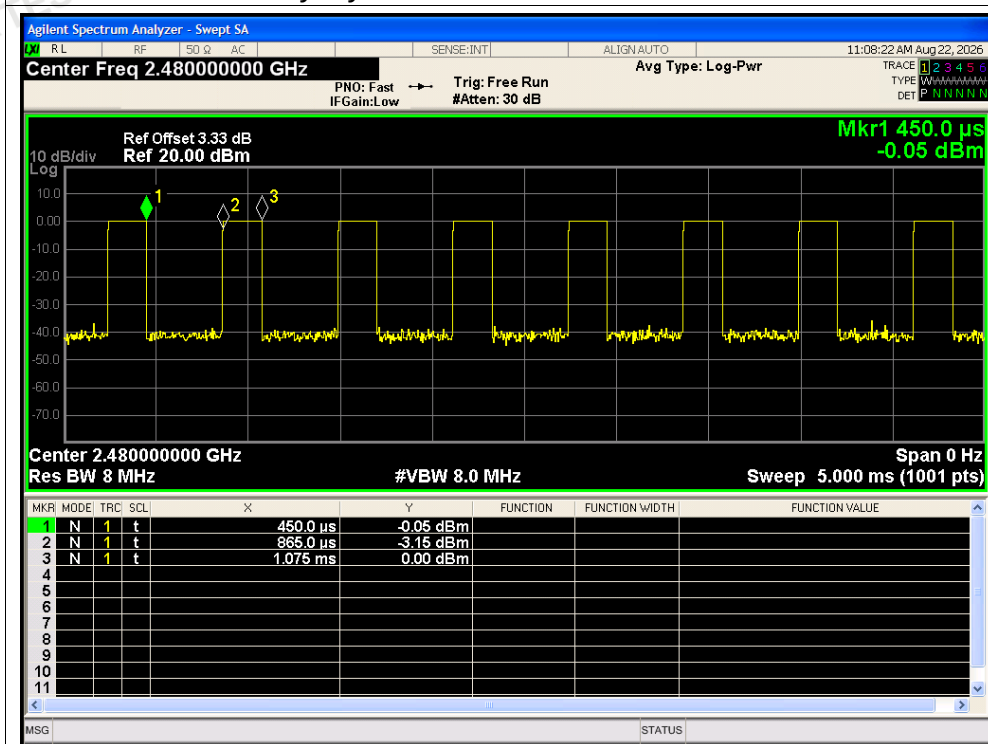
Duty Cycle NVNT BLE 2M 2402MHz



Duty Cycle NVNT BLE 2M 2440MHz



Duty Cycle NVNT BLE 2M 2480MHz



Maximum Conducted Output Power

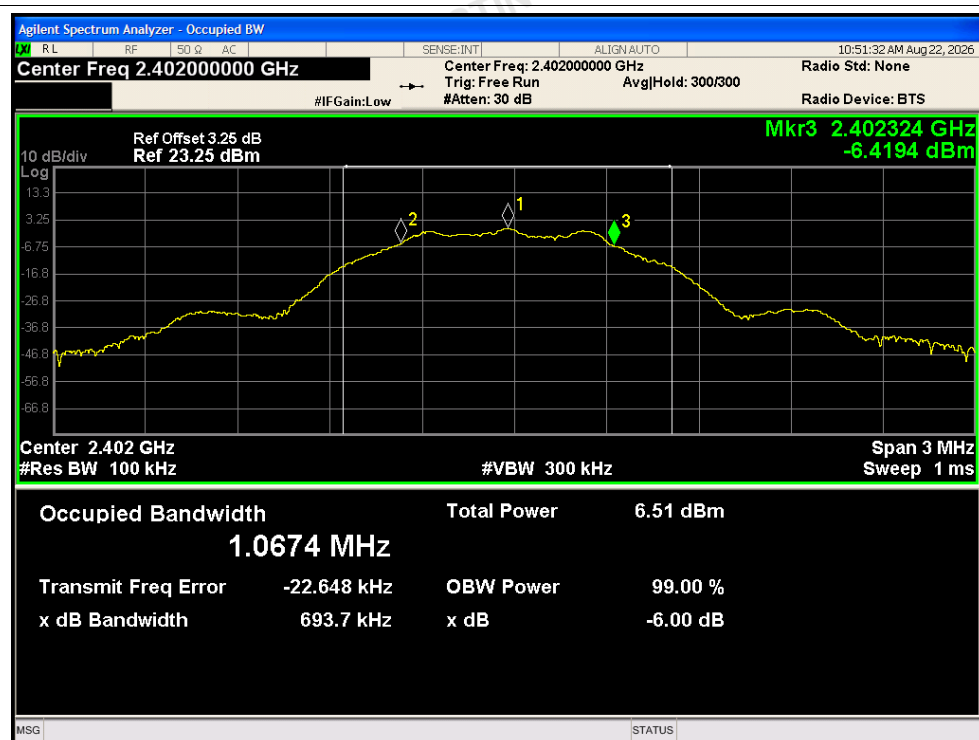
Condition	Mode	Frequency (MHz)	Conducted Power (dBm)	Limit (dBm)	Verdict
NVNT	BLE 1M	2402	0.04	30	Pass
NVNT	BLE 1M	2440	0.02	30	Pass
NVNT	BLE 1M	2480	0.05	30	Pass
NVNT	BLE 2M	2402	0.06	30	Pass
NVNT	BLE 2M	2440	0.03	30	Pass
NVNT	BLE 2M	2480	0.06	30	Pass

-6dB Bandwidth

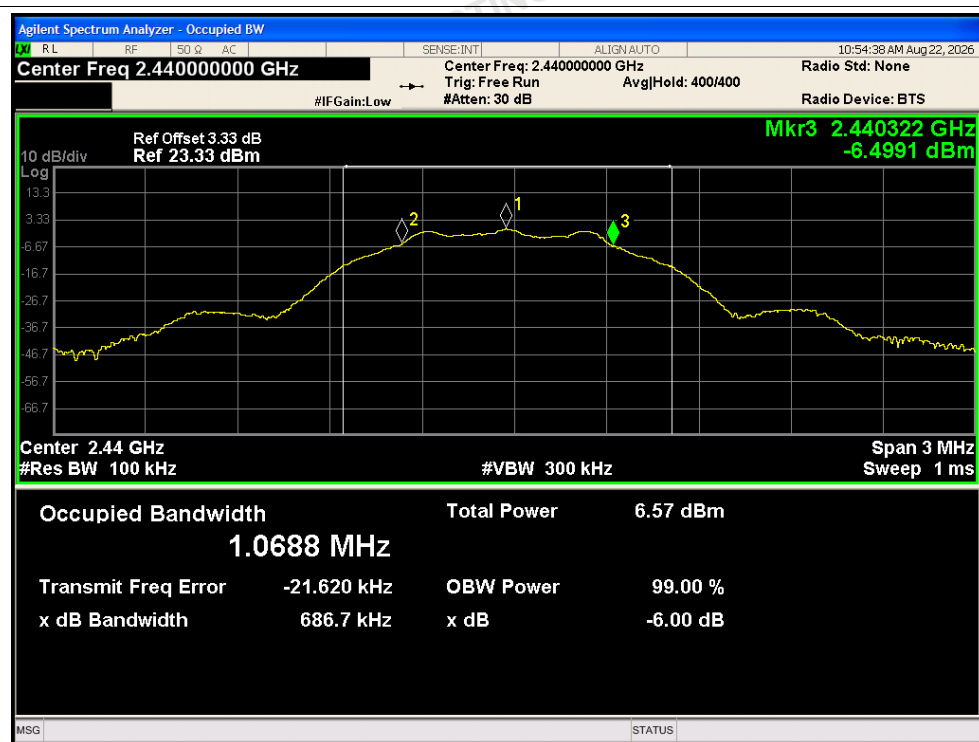
Condition	Mode	Frequency (MHz)	-6 dB Bandwidth (MHz)	Limit -6 dB Bandwidth (MHz)	Verdict
NVNT	BLE 1M	2402	0.694	0.5	Pass
NVNT	BLE 1M	2440	0.687	0.5	Pass
NVNT	BLE 1M	2480	0.701	0.5	Pass
NVNT	BLE 2M	2402	1.136	0.5	Pass
NVNT	BLE 2M	2440	1.138	0.5	Pass
NVNT	BLE 2M	2480	1.137	0.5	Pass

Test Graphs

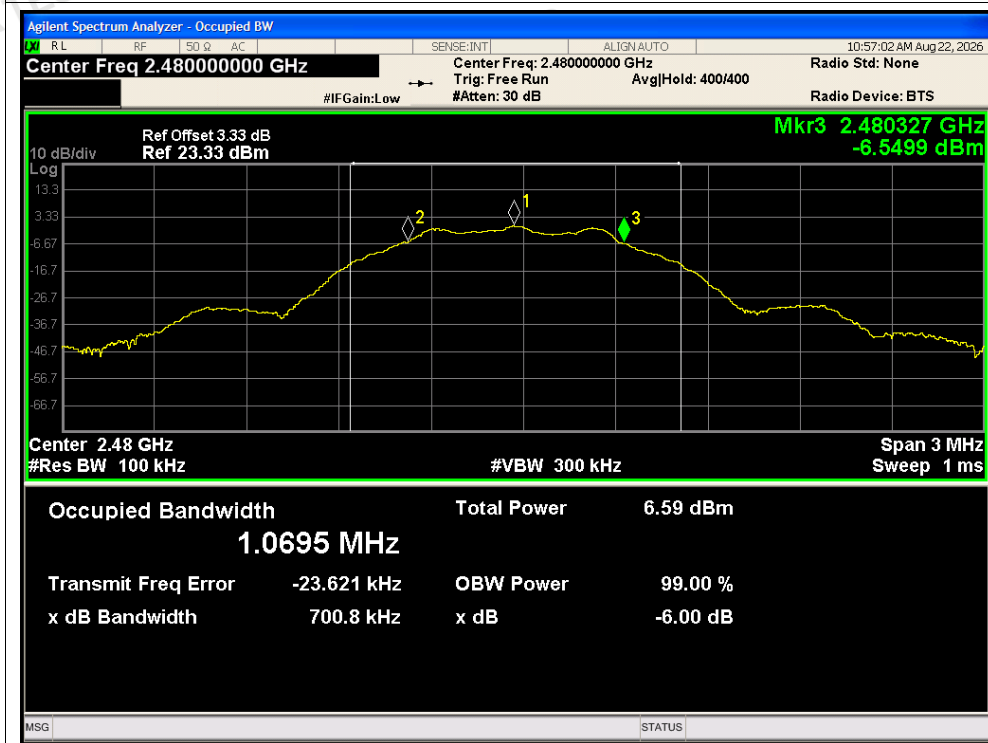
-6dB Bandwidth NVNT BLE 1M 2402MHz



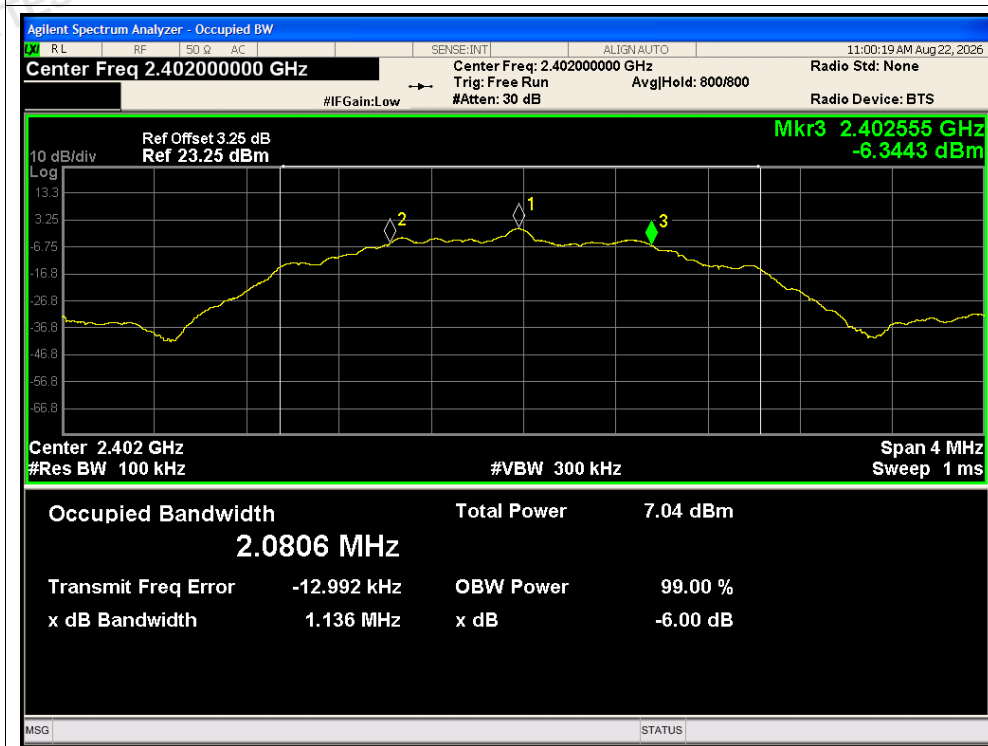
-6dB Bandwidth NVNT BLE 1M 2440MHz



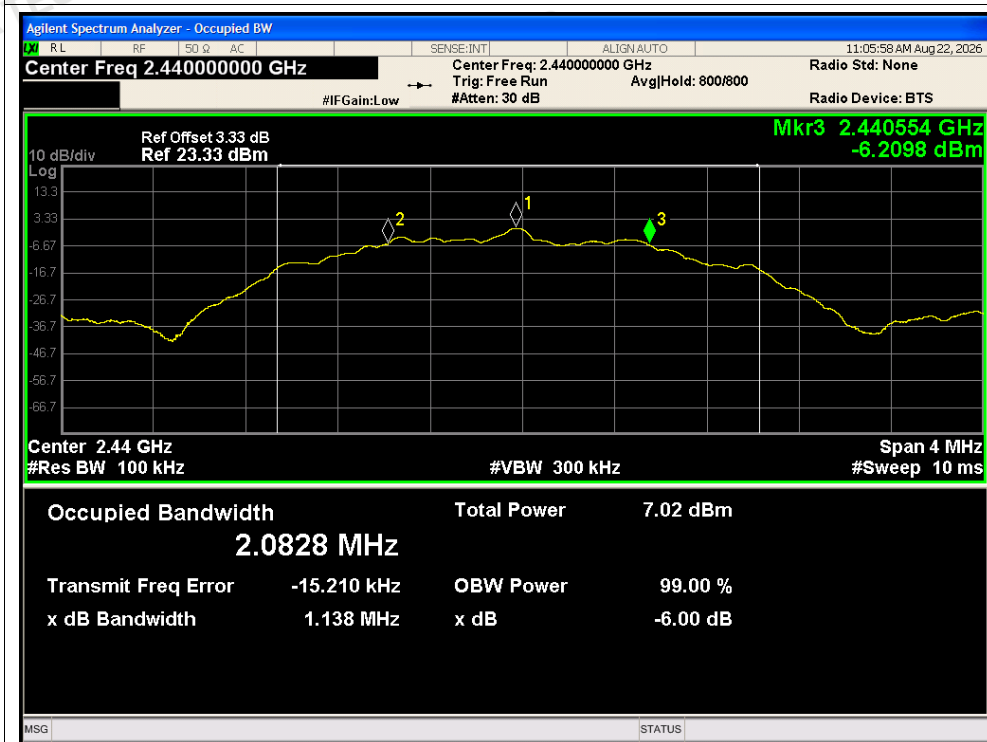
-6dB Bandwidth NVNT BLE 1M 2480MHz



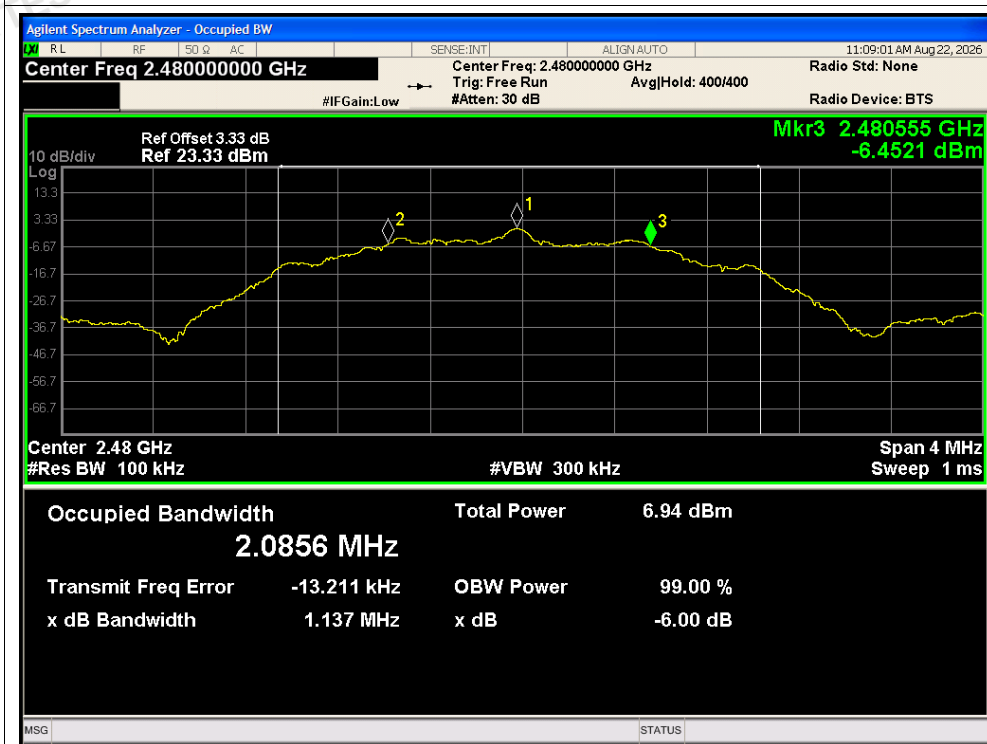
-6dB Bandwidth NVNT BLE 2M 2402MHz



-6dB Bandwidth NVNT BLE 2M 2440MHz



-6dB Bandwidth NVNT BLE 2M 2480MHz

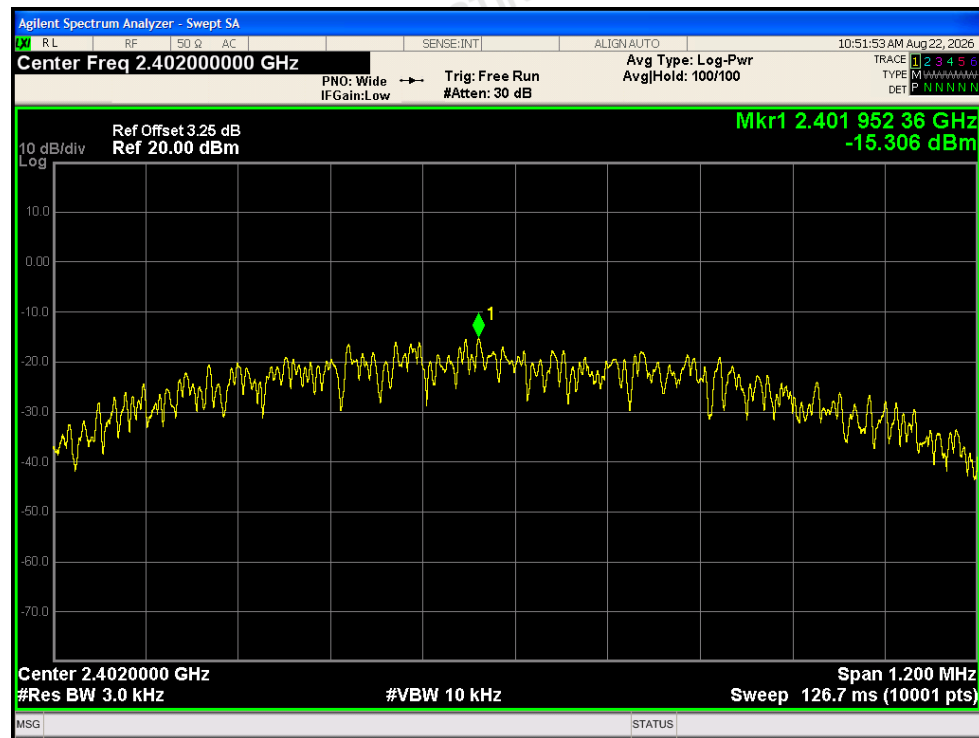


Maximum Power Spectral Density Level

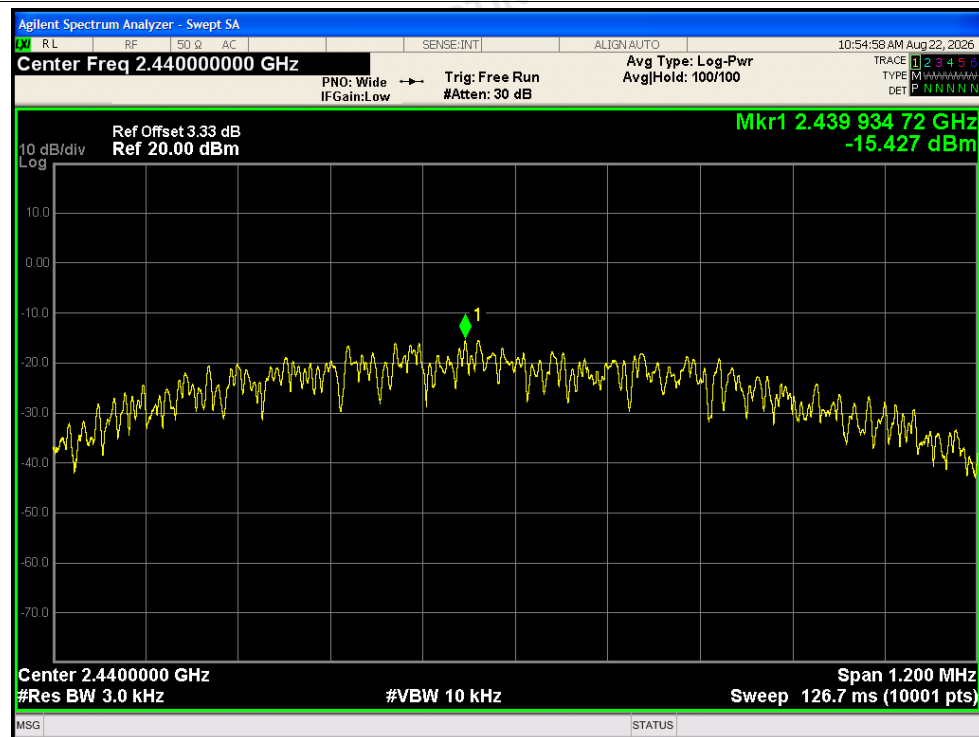
Condition	Mode	Frequency (MHz)	Conducted PSD (dBm/3kHz)	Limit (dBm/3kHz)	Verdict
NVNT	BLE 1M	2402	-15.31	8	Pass
NVNT	BLE 1M	2440	-15.43	8	Pass
NVNT	BLE 1M	2480	-15.32	8	Pass
NVNT	BLE 2M	2402	-17.87	8	Pass
NVNT	BLE 2M	2440	-17.92	8	Pass
NVNT	BLE 2M	2480	-17.76	8	Pass

Test Graphs

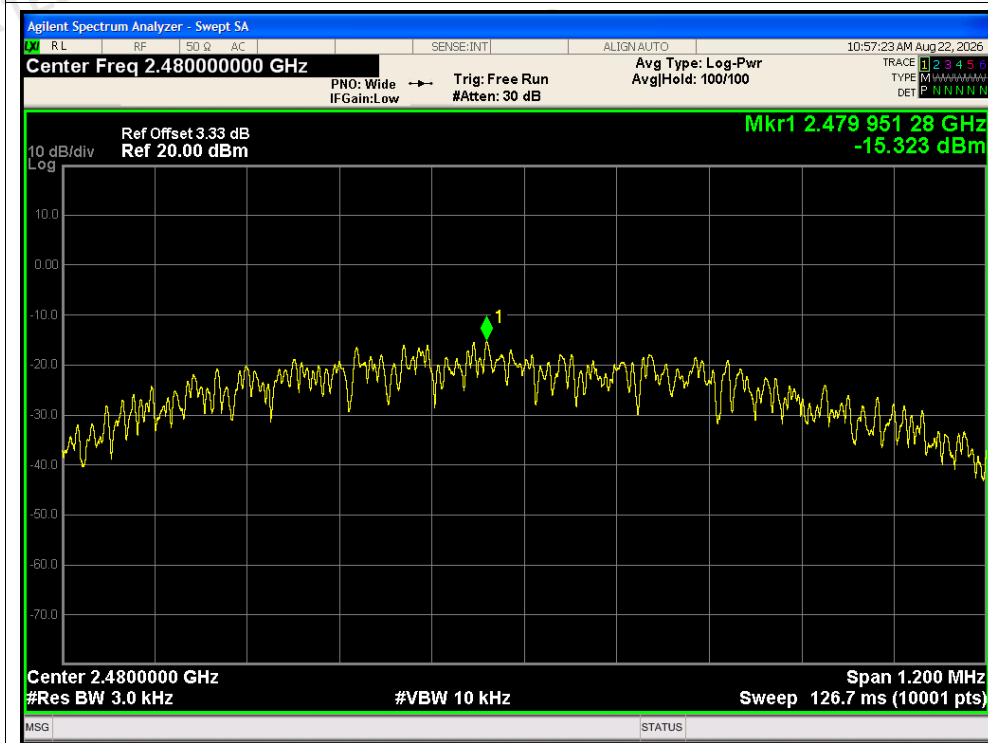
PSD NVNT BLE 1M 2402MHz



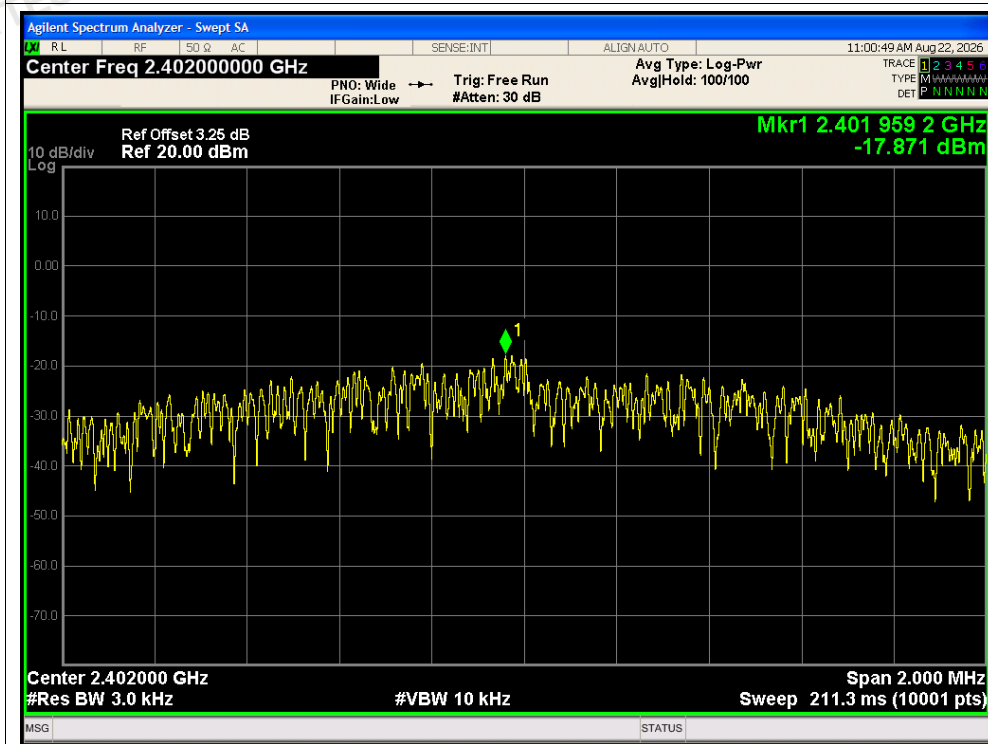
PSD NVNT BLE 1M 2440MHz



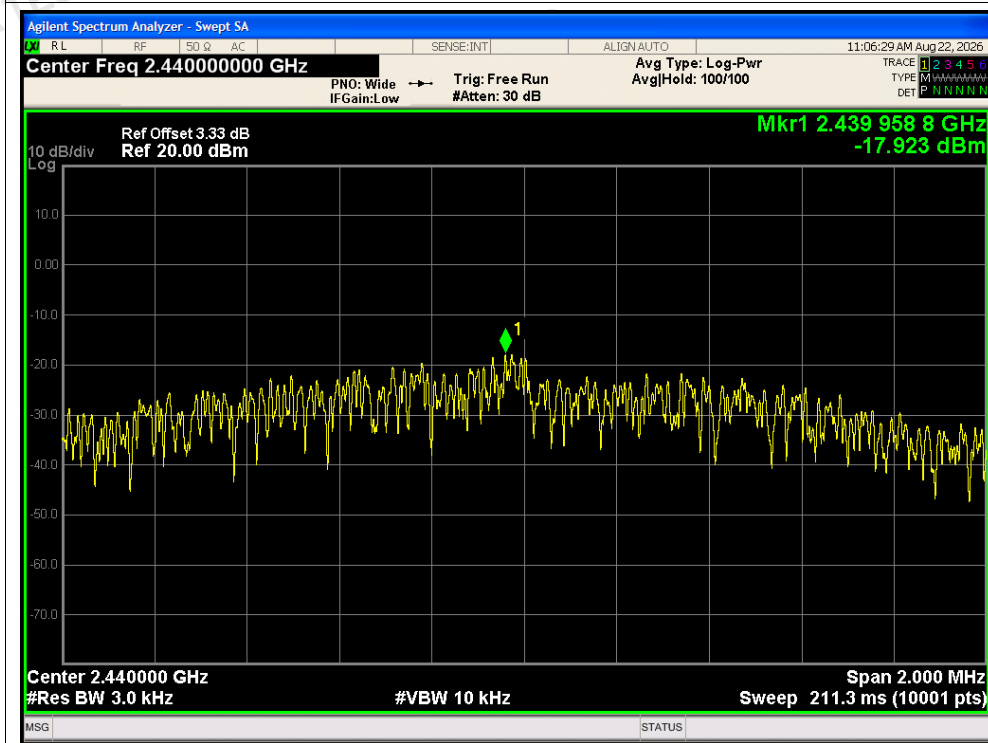
PSD NVNT BLE 1M 2480MHz



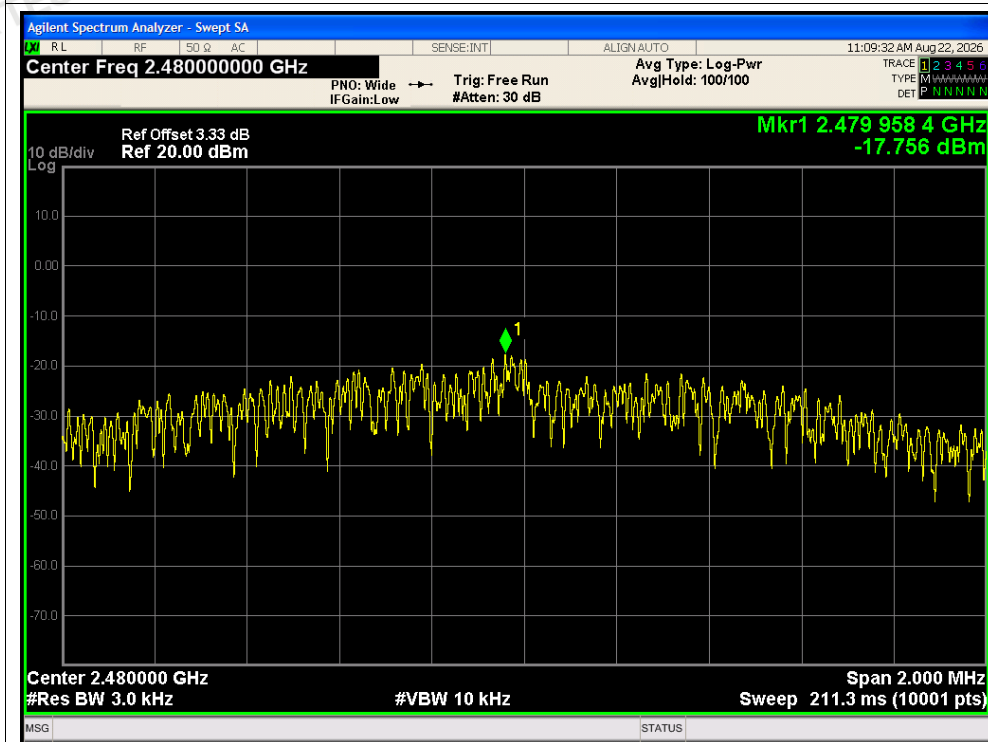
PSD NVNT BLE 2M 2402MHz



PSD NVNT BLE 2M 2440MHz



PSD NVNT BLE 2M 2480MHz

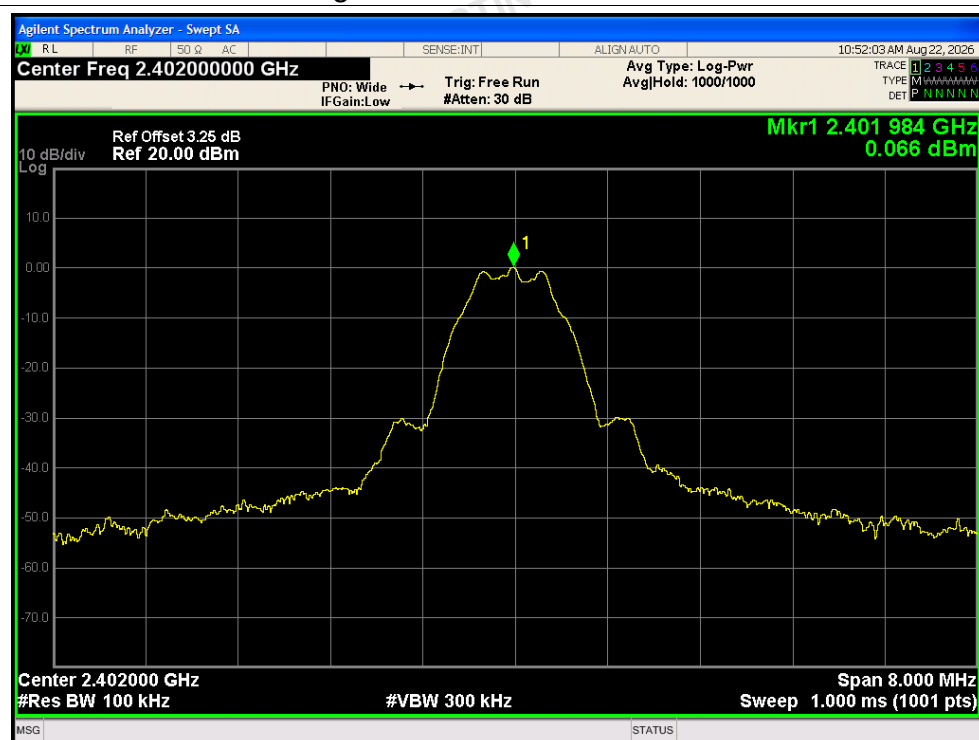


Band Edge

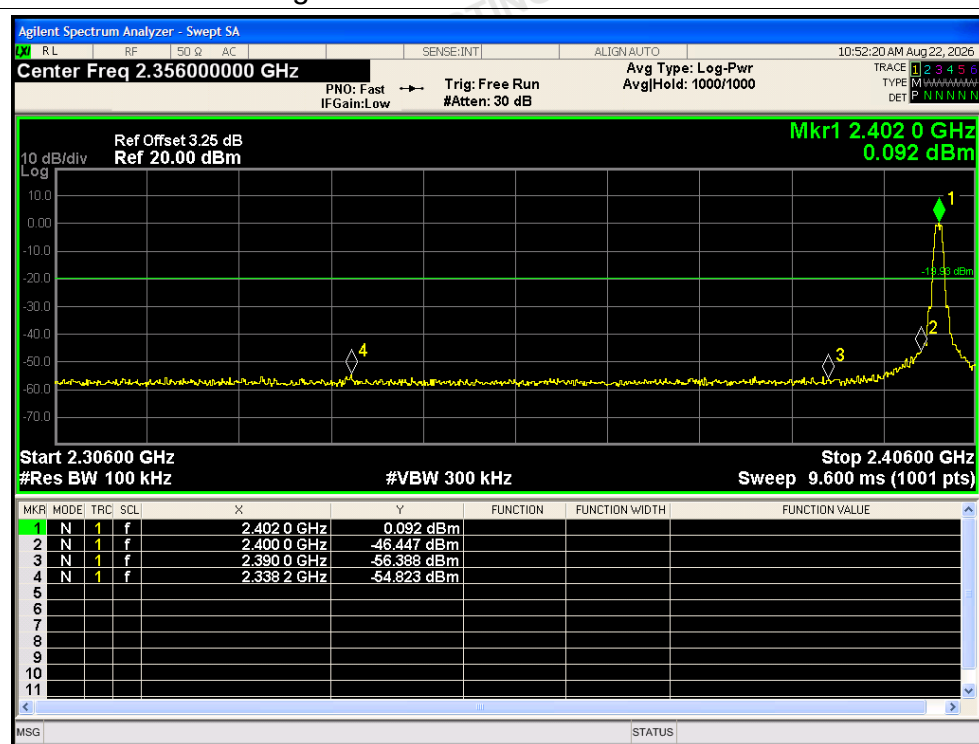
Condition	Mode	Frequency (MHz)	Max Value (dBc)	Limit (dBc)	Verdict
NVNT	BLE 1M	2402	-54.89	-20	Pass
NVNT	BLE 1M	2480	-50.43	-20	Pass
NVNT	BLE 2M	2402	-55.53	-20	Pass
NVNT	BLE 2M	2480	-50.49	-20	Pass

Test Graphs

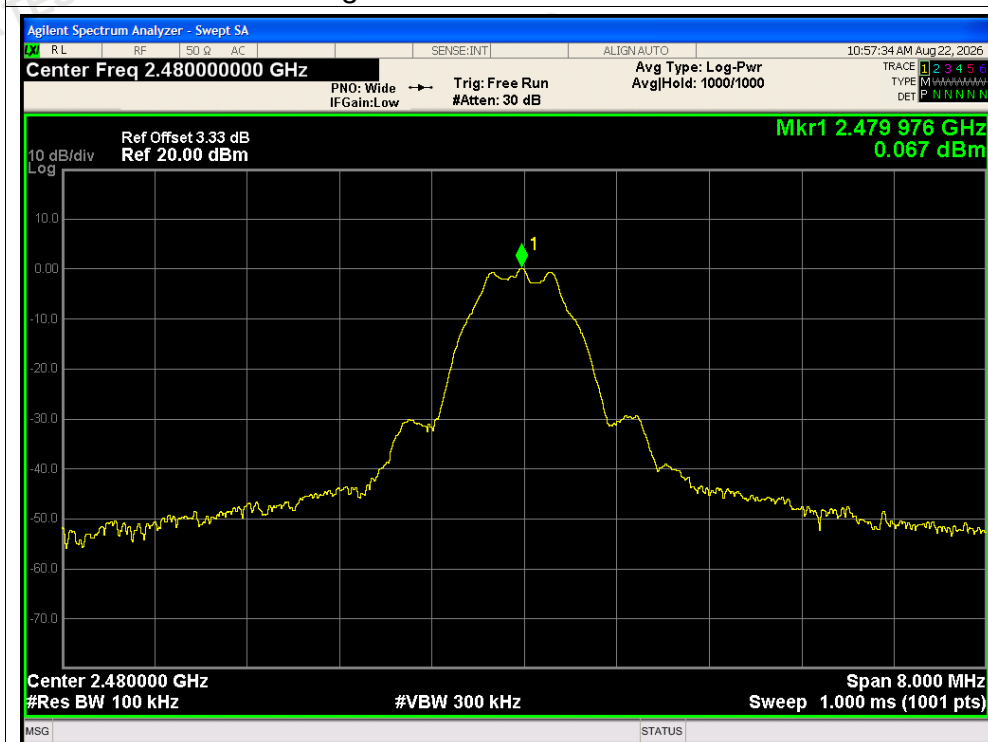
Band Edge NVNT BLE 1M 2402MHz Ref



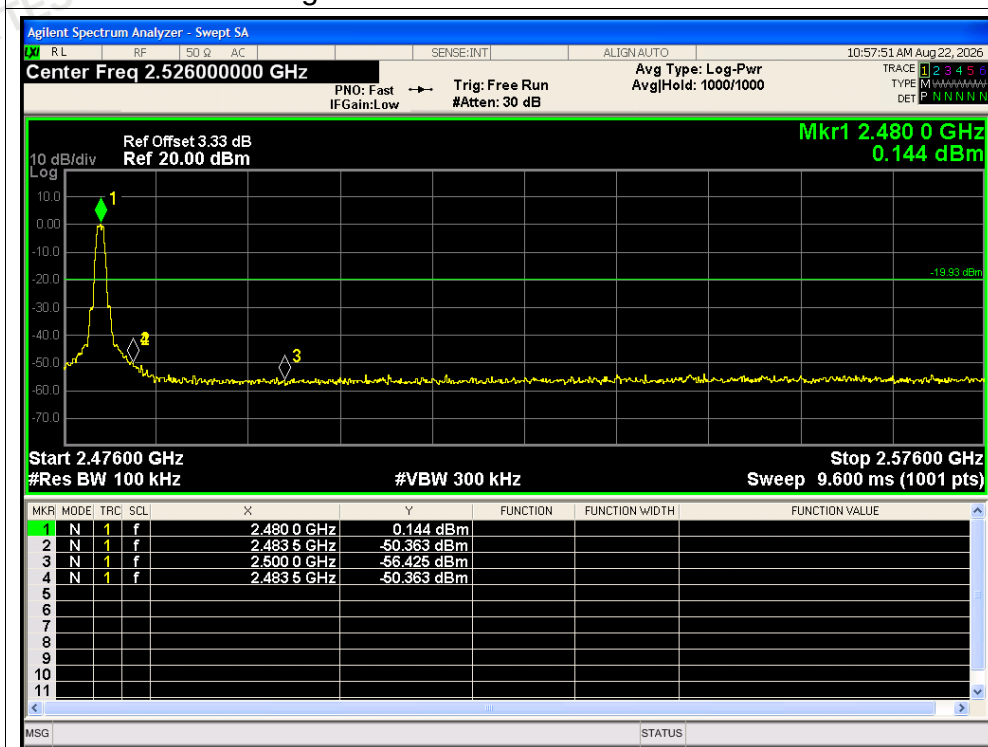
Band Edge NVNT BLE 1M 2402MHz Emission



Band Edge NVNT BLE 1M 2480MHz Ref



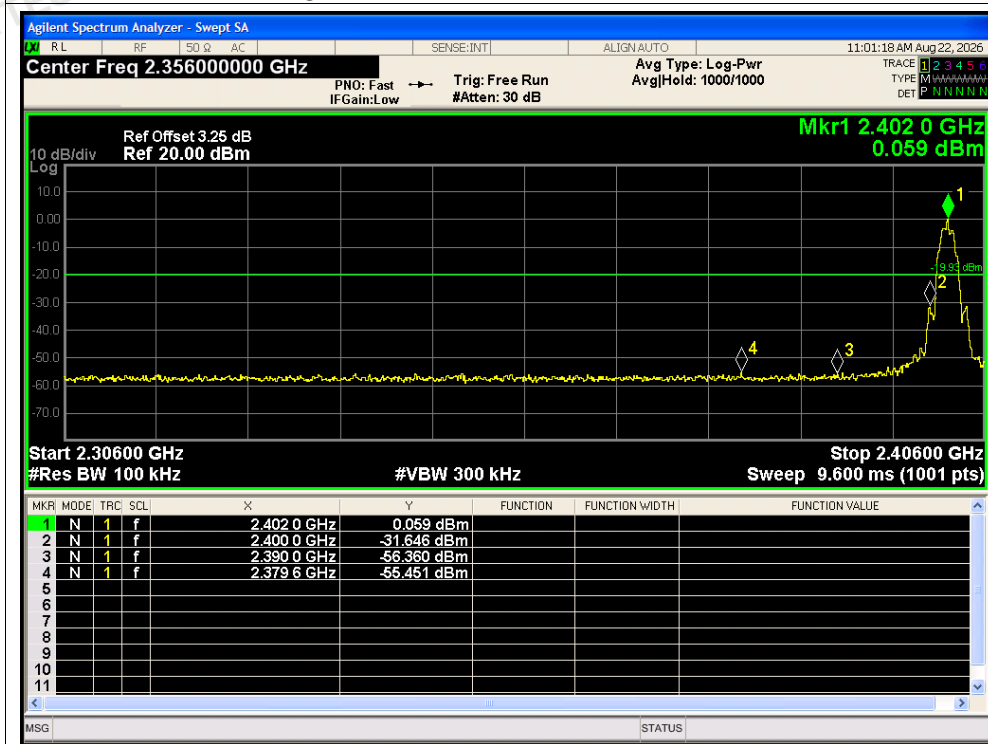
Band Edge NVNT BLE 1M 2480MHz Emission



Band Edge NVNT BLE 2M 2402MHz Ref



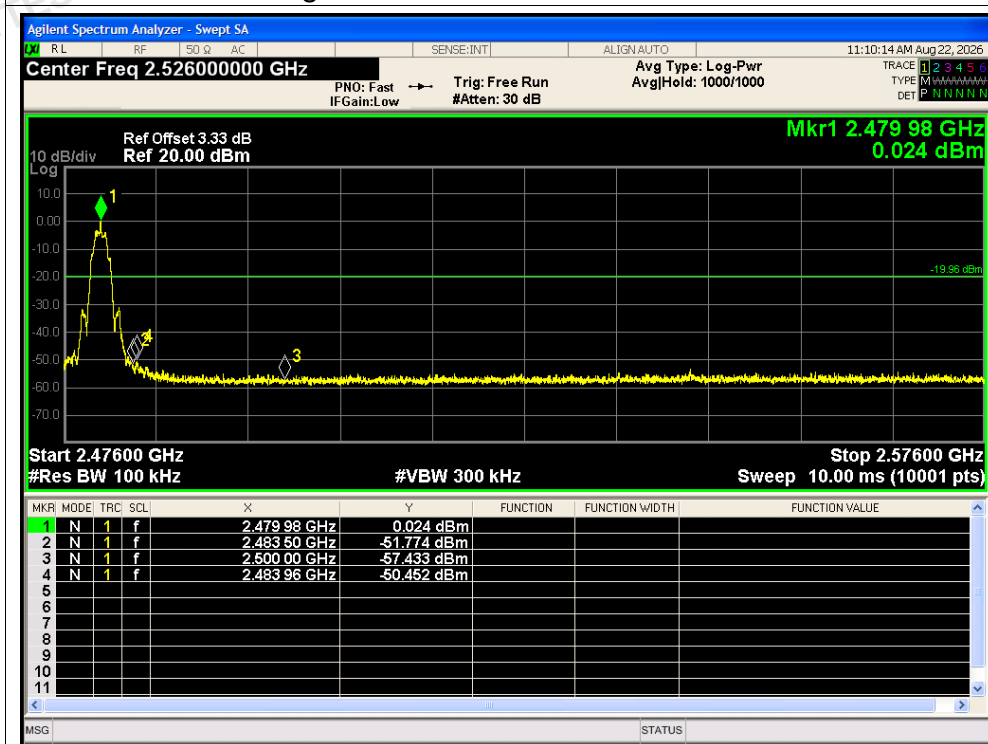
Band Edge NVNT BLE 2M 2402MHz Emission



Band Edge NVNT BLE 2M 2480MHz Ref



Band Edge NVNT BLE 2M 2480MHz Emission



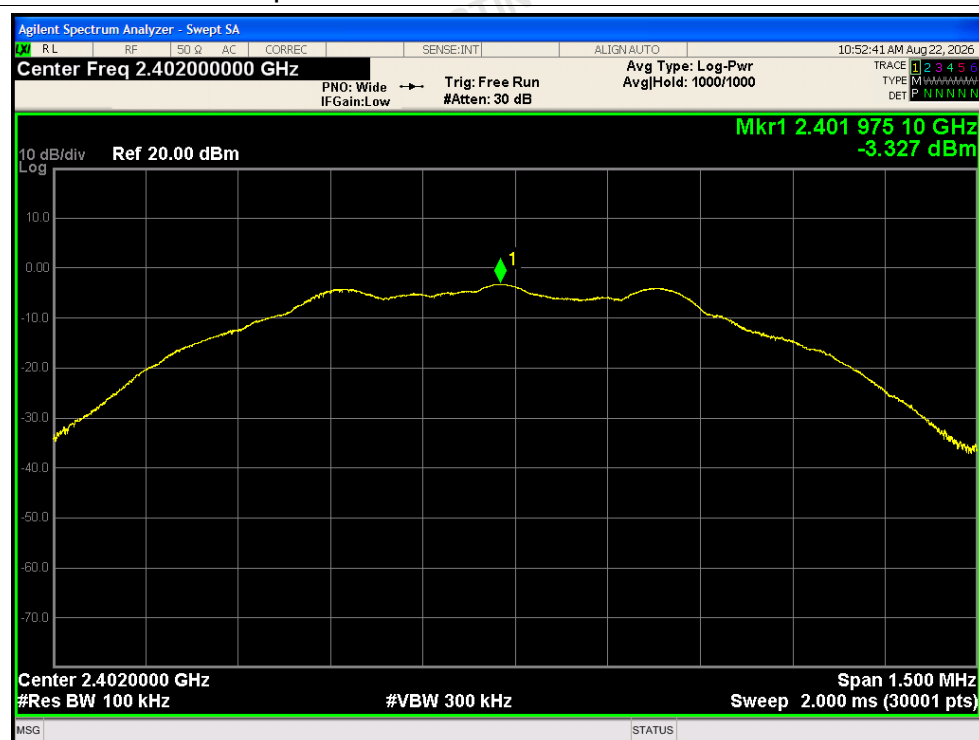
Conducted RF Spurious Emission

Condition	Mode	Frequency (MHz)	Max Value (dBc)	Limit (dBc)	Verdict
NVNT	BLE 1M	2402	-40.34	-20	Pass
NVNT	BLE 1M	2440	-40.18	-20	Pass
NVNT	BLE 1M	2480	-40.19	-20	Pass
NVNT	BLE 2M	2402	-39.73	-20	Pass
NVNT	BLE 2M	2440	-39.49	-20	Pass
NVNT	BLE 2M	2480	-40.14	-20	Pass

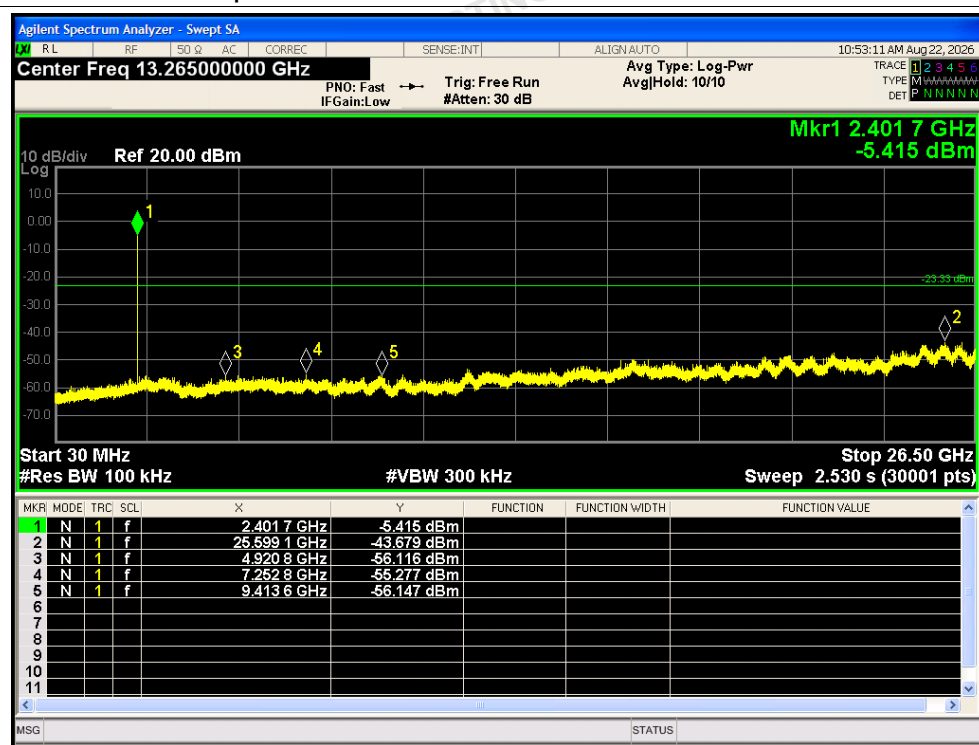
Note: Cable loss compensation correct within the spectrum analyzer.

Test Graphs

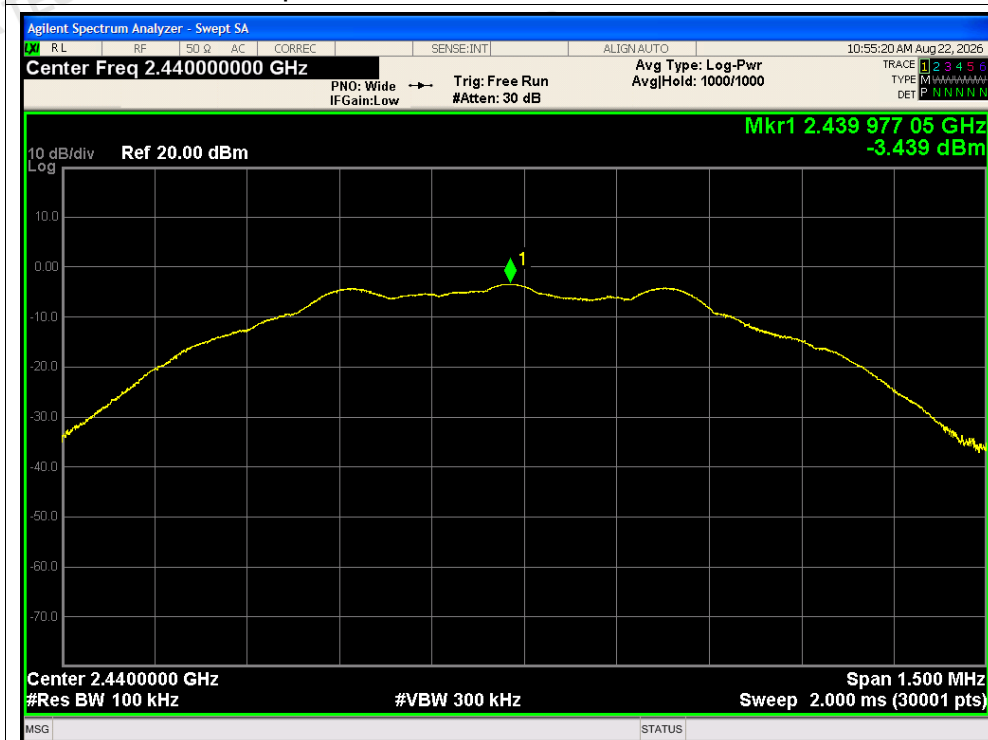
Tx. Spurious NVNT BLE 1M 2402MHz Ref



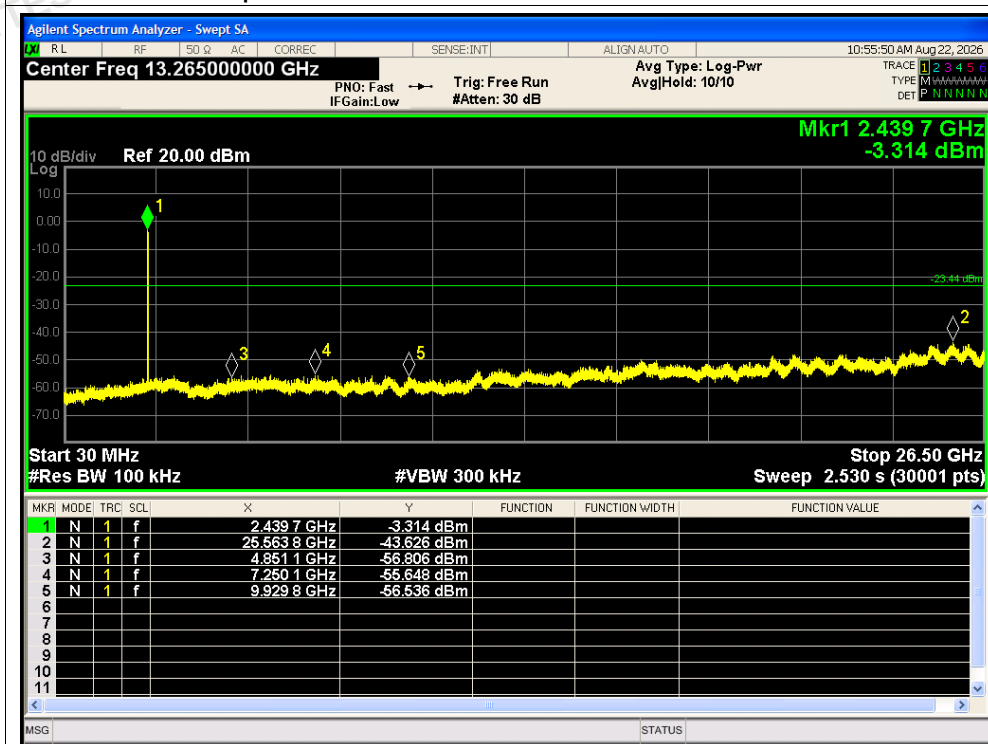
Tx. Spurious NVNT BLE 1M 2402MHz Emission



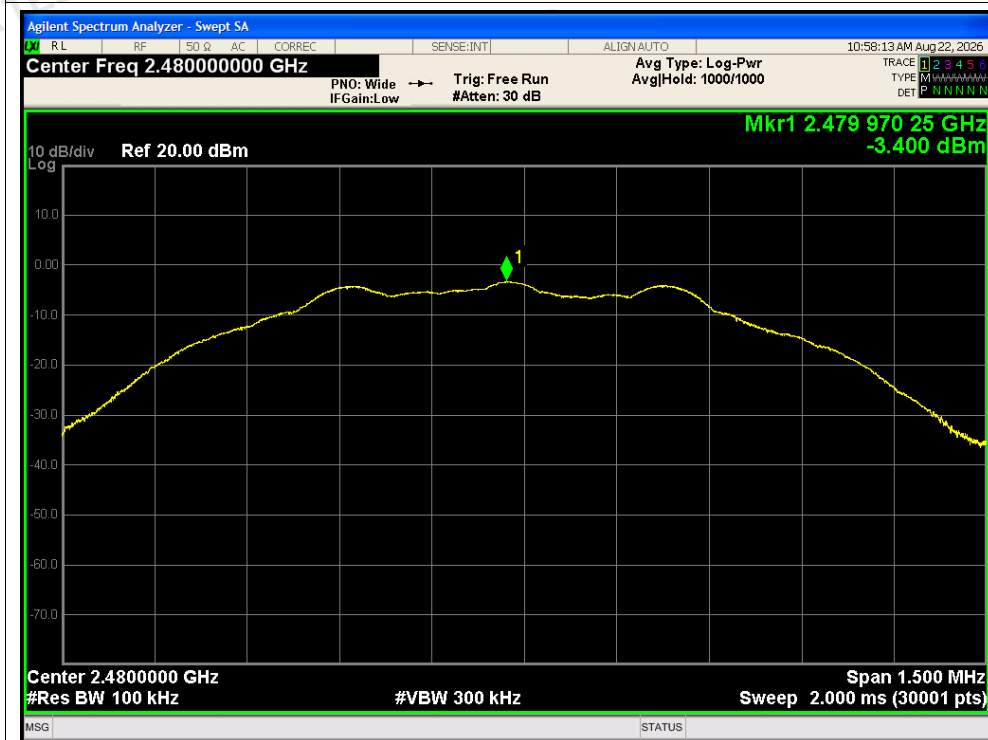
Tx. Spurious NVNT BLE 1M 2440MHz Ref



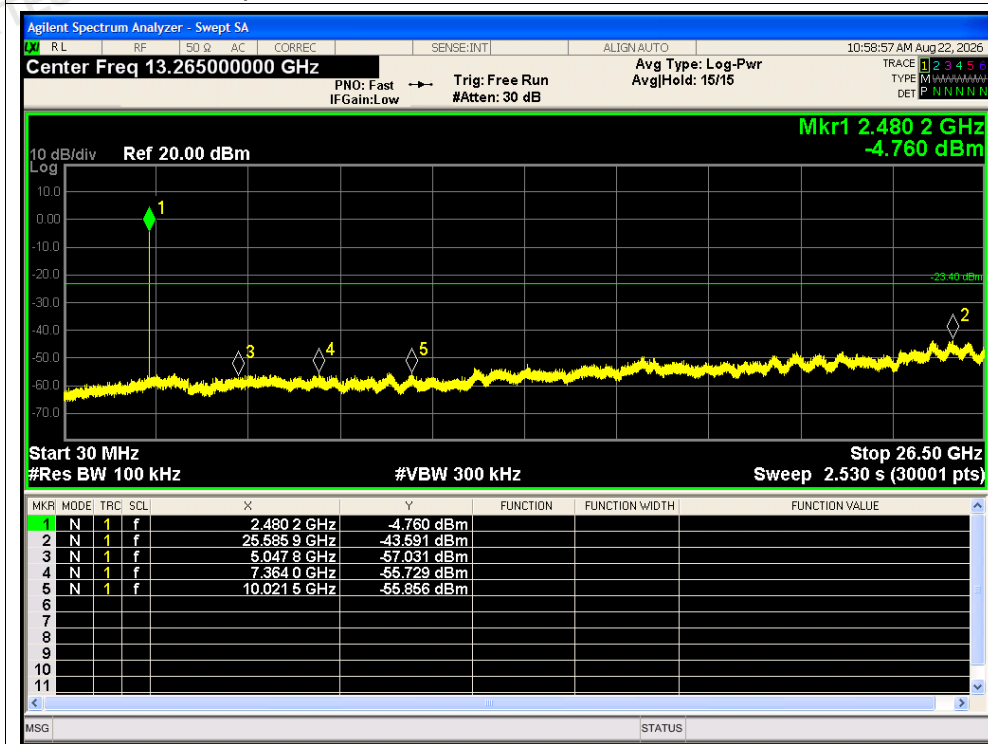
Tx. Spurious NVNT BLE 1M 2440MHz Emission



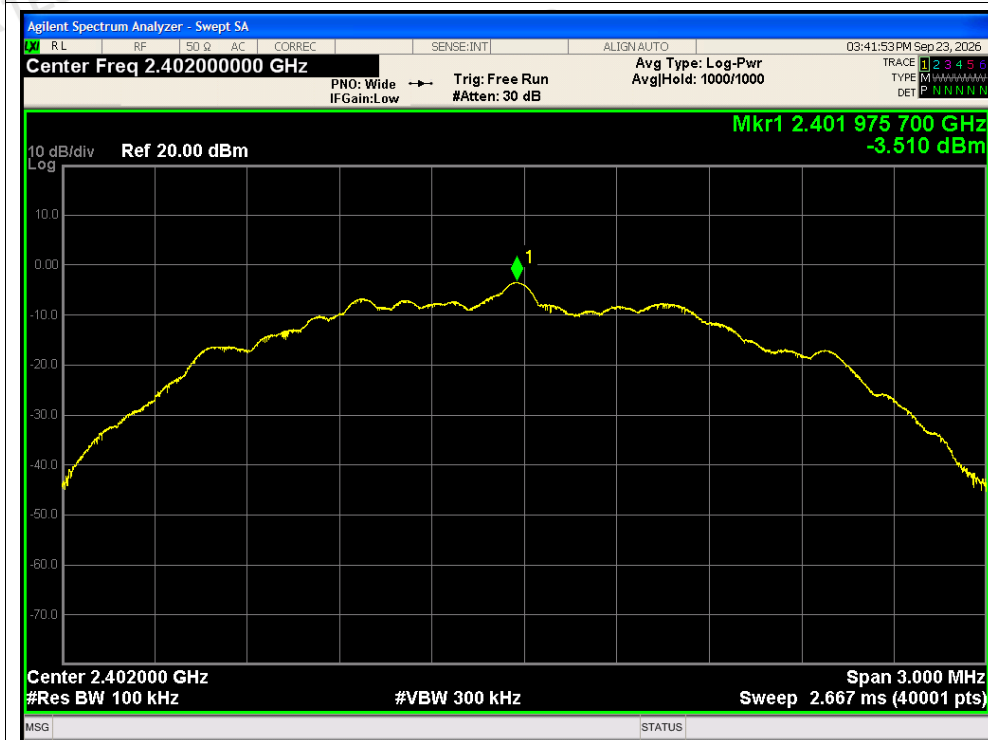
Tx. Spurious NVNT BLE 1M 2480MHz Ref



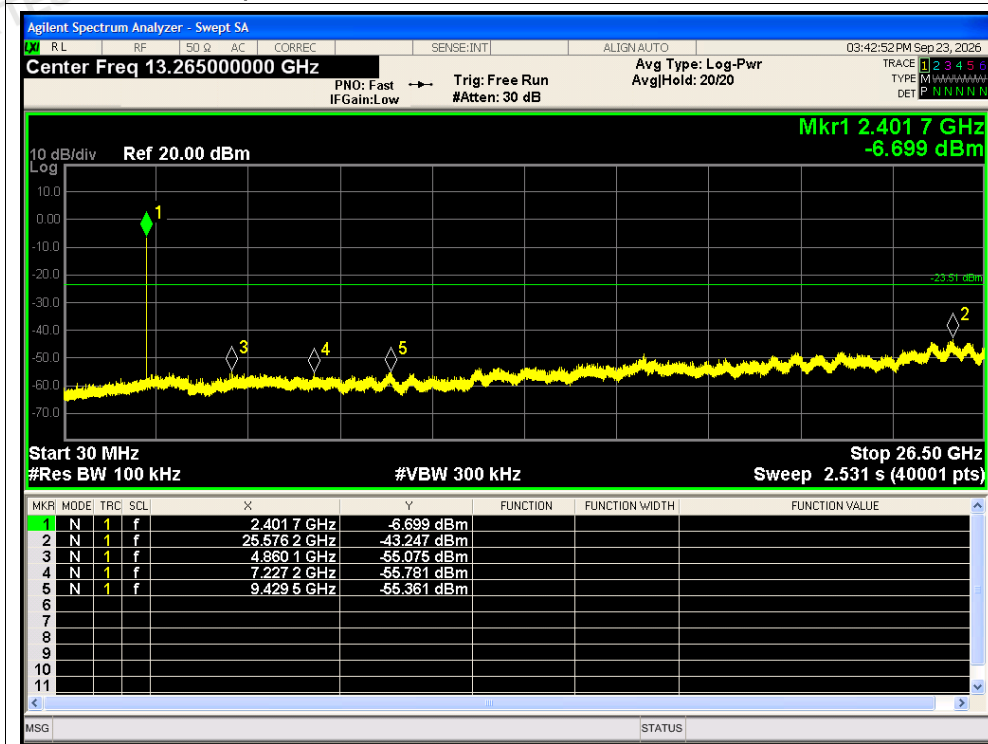
Tx. Spurious NVNT BLE 1M 2480MHz Emission



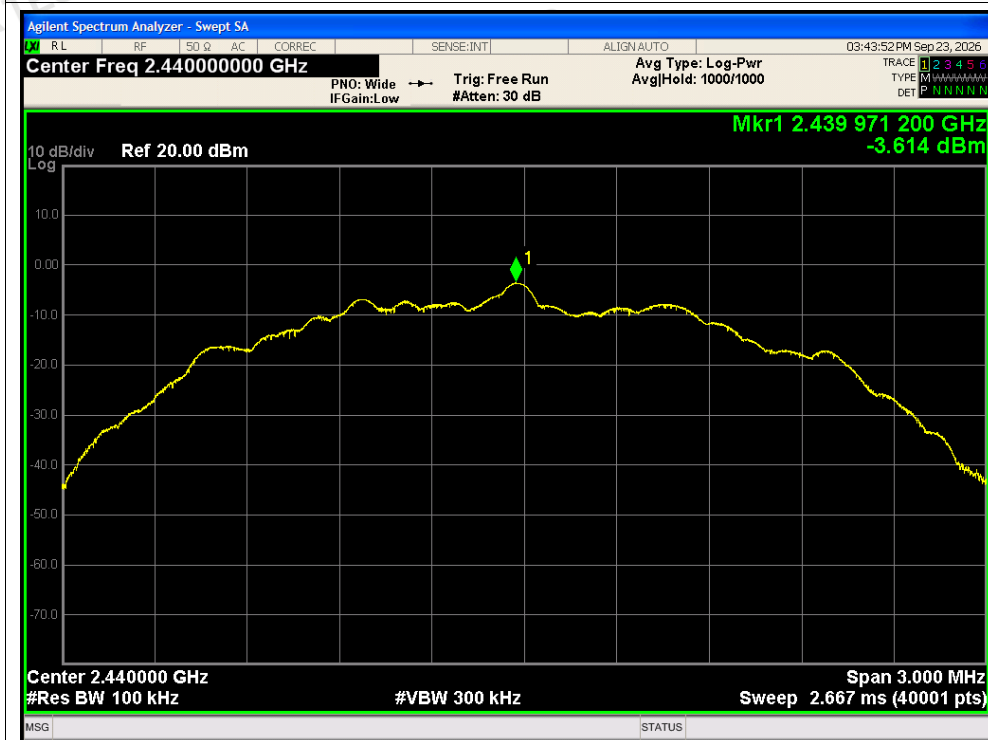
Tx. Spurious NVNT BLE 2M 2402MHz Ref



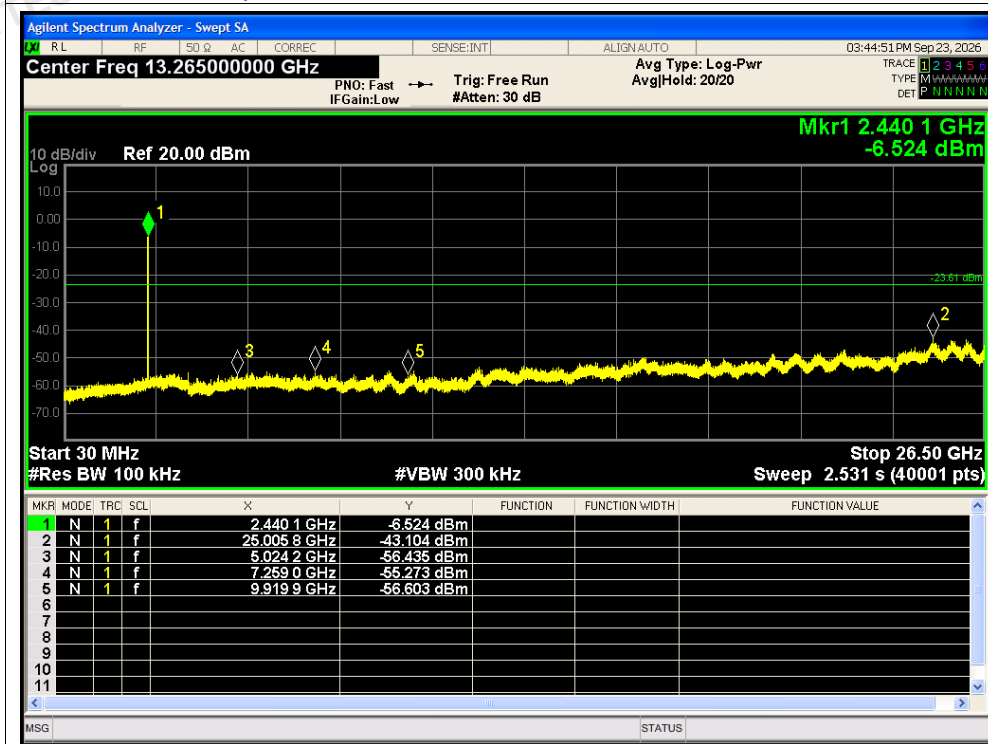
Tx. Spurious NVNT BLE 2M 2402MHz Emission



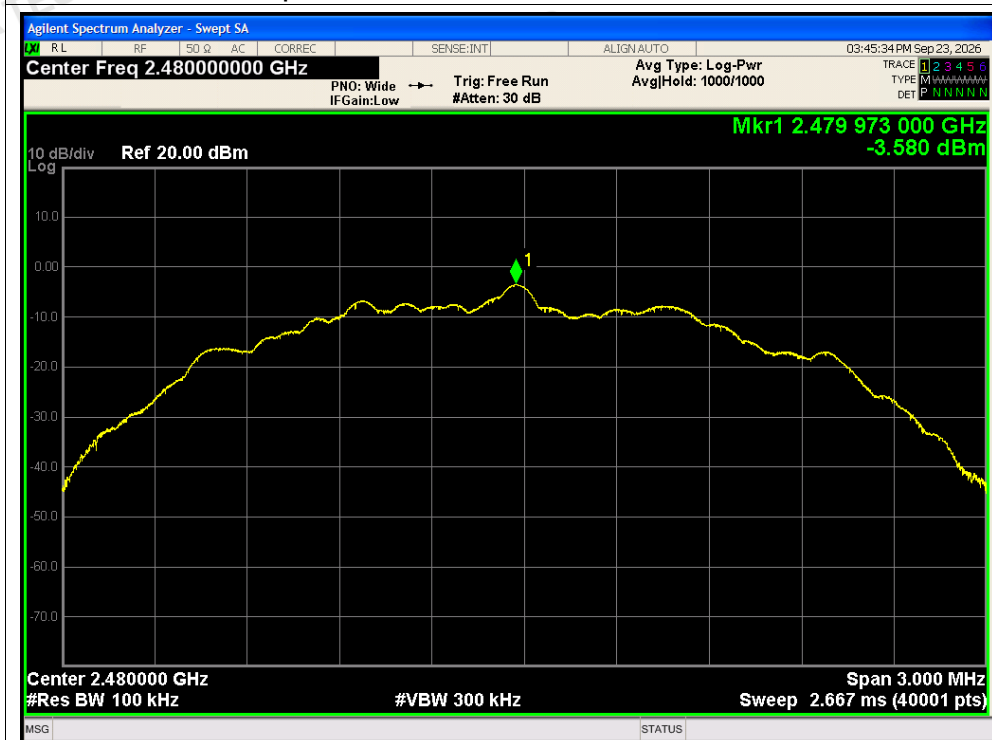
Tx. Spurious NVNT BLE 2M 2440MHz Ref



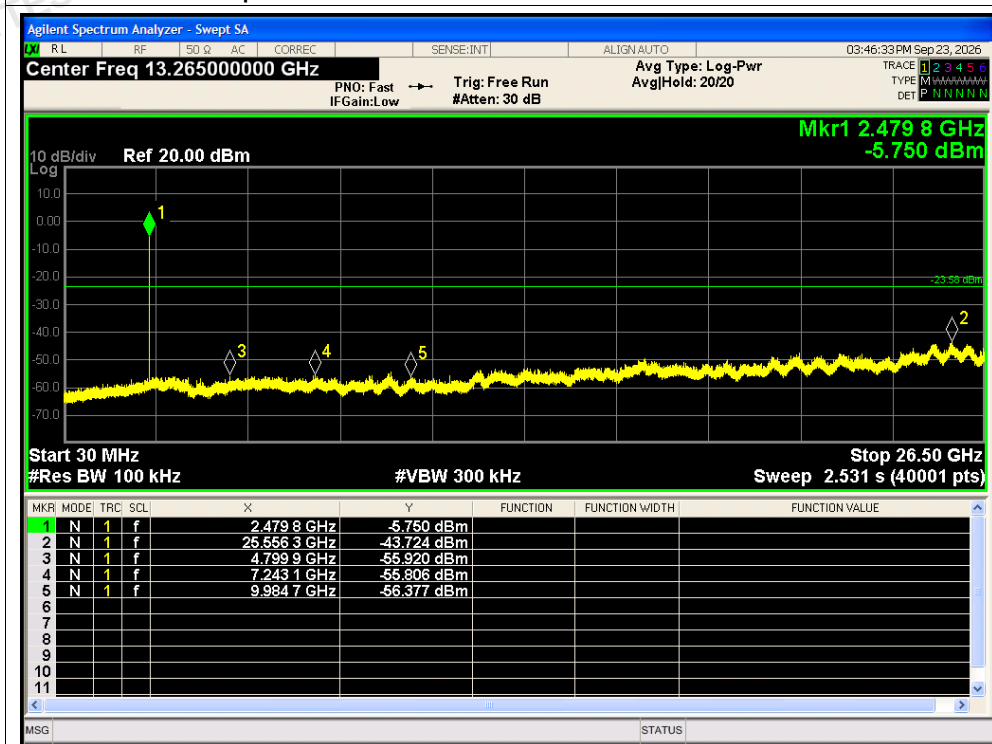
Tx. Spurious NVNT BLE 2M 2440MHz Emission



Tx. Spurious NVNT BLE 2M 2480MHz Ref



Tx. Spurious NVNT BLE 2M 2480MHz Emission



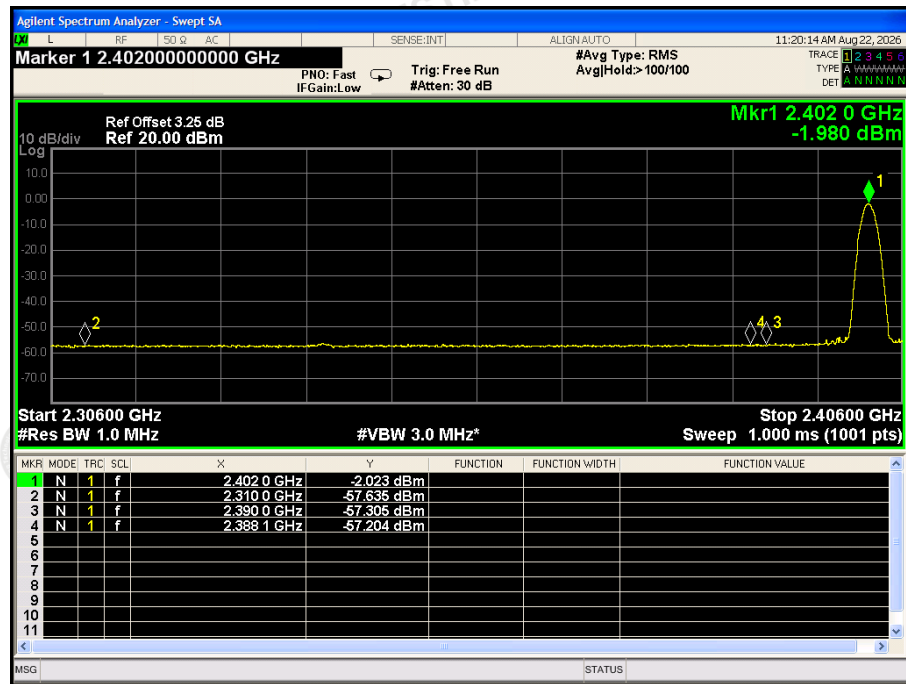
Emissions in Restricted Bands

Test Mode	Ch	Freq (MHz)	Detector	Freq [MHz]	Result [dBm]	Gain [dBi]	DC Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Verdict
BLE 1M	Low	2402	AV	2310.000	-57.64	2.00	1.94	41.50	≤54	PASS
			AV	2388.100	-57.20	2.00	1.94	41.94	≤54	PASS
			AV	2390.000	-57.31	2.00	1.94	41.83	≤54	PASS
			Peak	2310.000	-47.16	2.00	0.00	50.04	≤74	PASS
			Peak	2388.400	-43.03	2.00	0.00	54.17	≤74	PASS
			Peak	2390.000	-44.39	2.00	0.00	52.81	≤74	PASS
	High	2480	AV	2483.500	-55.52	2.00	1.94	43.62	≤54	PASS
			AV	2492.300	-56.73	2.00	1.94	42.41	≤54	PASS
			AV	2500.000	-57.02	2.00	1.94	42.12	≤54	PASS
			Peak	2483.500	-33.22	2.00	0.00	63.98	≤74	PASS
			Peak	2492.200	-42.47	2.00	0.00	54.73	≤74	PASS
			Peak	2500.000	-47.05	2.00	0.00	50.15	≤74	PASS
BLE 2M	Low	2402	AV	2310.000	-57.42	2.00	4.64	44.42	≤54	PASS
			AV	2386.400	-57.29	2.00	4.64	44.55	≤54	PASS
			AV	2390.000	-57.29	2.00	4.64	44.55	≤54	PASS
			Peak	2310.000	-47.29	2.00	0.00	49.91	≤74	PASS
			Peak	2386.100	-43.39	2.00	0.00	53.81	≤74	PASS
			Peak	2390.000	-43.91	2.00	0.00	53.29	≤74	PASS
	High	2480	AV	2483.500	-53.83	2.00	4.64	48.01	≤54	PASS
			AV	2488.400	-56.26	2.00	4.64	45.58	≤54	PASS
			AV	2500.000	-56.73	2.00	4.64	45.11	≤54	PASS
			Peak	2483.500	-32.92	2.00	0.00	64.28	≤74	PASS
			Peak	2488.400	-39.97	2.00	0.00	57.23	≤74	PASS
			Peak	2500.000	-46.73	2.00	0.00	50.47	≤74	PASS

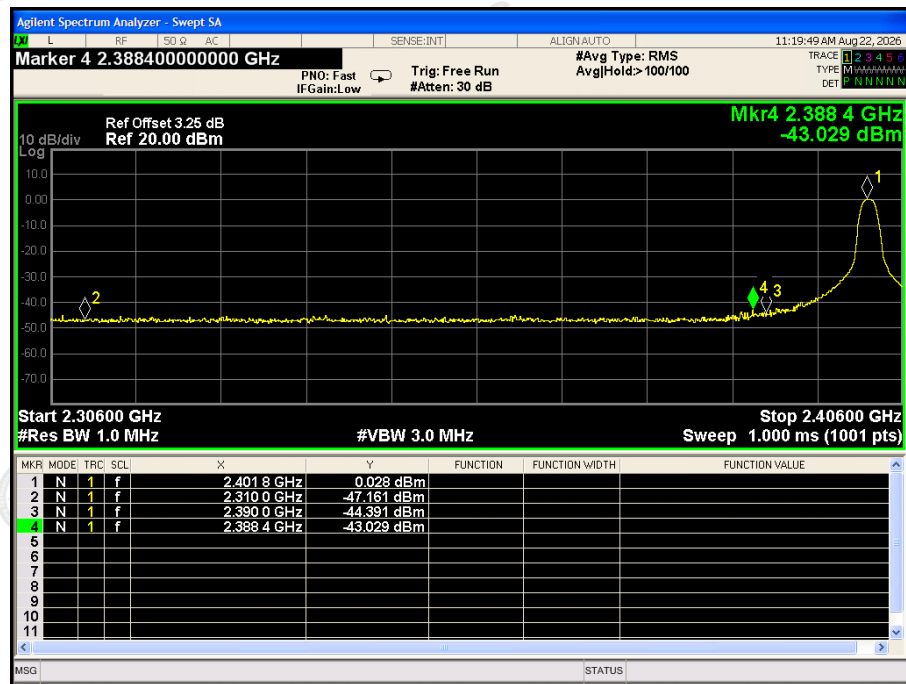
Note: 1. The limit in dBm for average detector is conversion from 54dBuV/m, according to 15.209(a). The limit in dBm for peak detector is 20dB above the limit of average detector in dBm.

Test Graphs

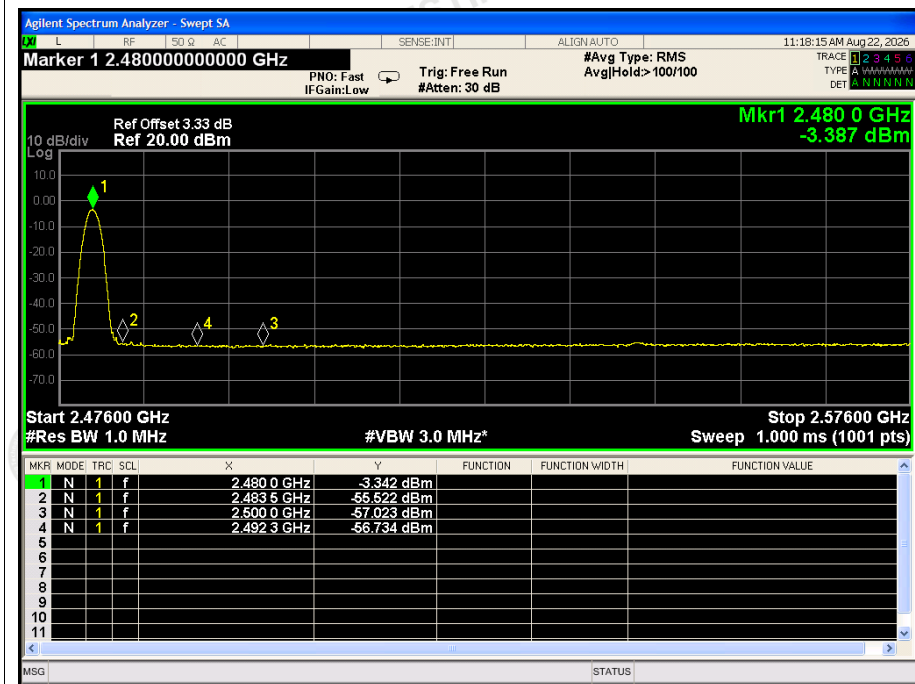
NVNT BLE 1M 2402MHz AV



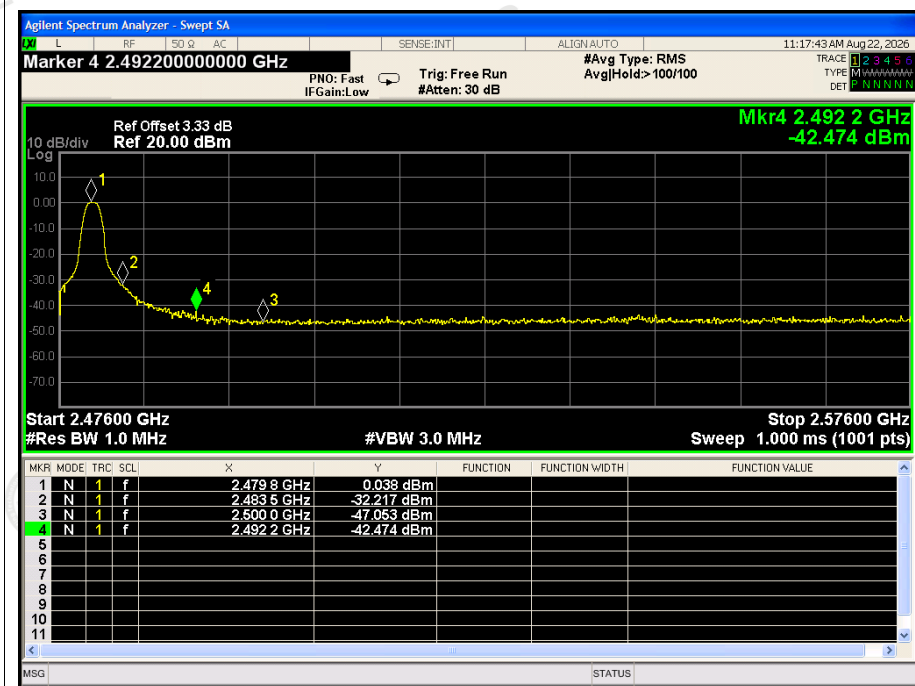
NVNT BLE 1M 2402MHz PK



NVNT BLE 1M 2480MHz AV

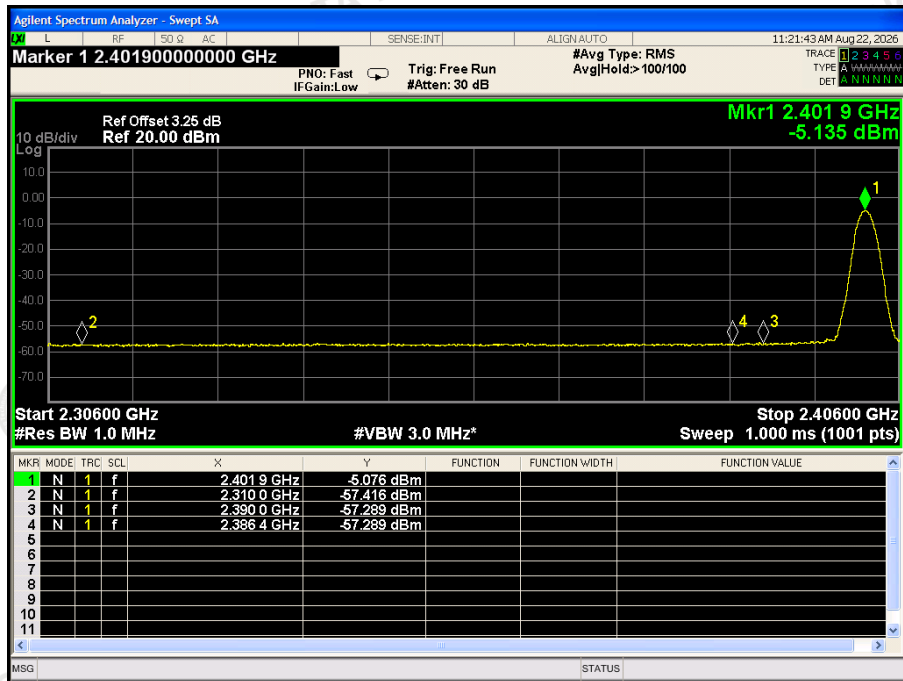


NVNT BLE 1M 2480MHz PK

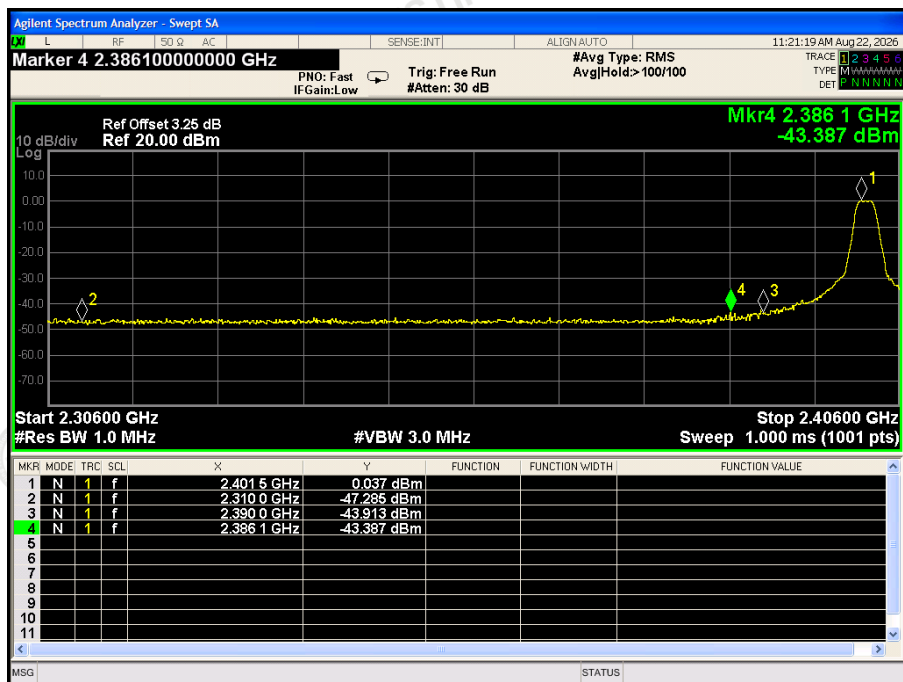


Test Graphs

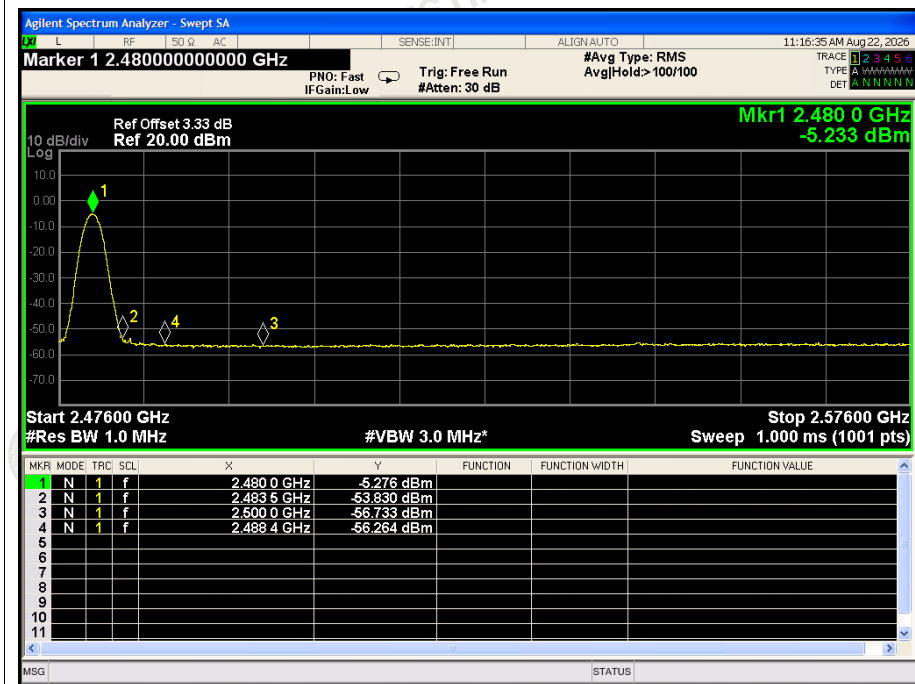
NVNT BLE 2M 2402MHz AV



NVNT BLE 2M 2402MHz PK



NVNT BLE 2M 2480MHz AV



NVNT BLE 2M 2480MHz PK

